

IN THE SPECIFICATION

Please rewrite the paragraphs beginning on page 3, line 18, and ending on page 6, line 14, as follows:

First, the preliminary discharge period 2 is explained. A ~~positive~~ negative preliminary discharge pulse 5 6 is applied to the X electrode 22, and a ~~negative~~ positive preliminary discharge pulse 6 5 is applied to the Y electrode 23. Thereby, a difference in formation of wall charges at the final point of the previous SF due to the emission condition of the previous SF is reset and initialized, and at the same time, all pixels are forcibly discharged, and a priming effect for subsequent writing discharge at a low voltage is obtained. In Fig. 3, each of the positive and negative preliminary discharge pulses 5 and 6 is generated once, however, each pulse may be divided to perform two roles so that a sustaining eliminating pulse for resetting the previous SF condition is applied, and thereafter a priming pulse for generating a priming effect by discharging all pixels is applied. At this time, the number of sustaining eliminating pulses is not limited to one, and different pulses may be applied several times. The priming effect is not required for each SF, there is also a method in which a priming pulse is applied only once per several SFs. The priming pulse causes all pixels to emit light regardless of displays. Therefore, by reducing the number of priming pulses to be applied, luminance for a black display can be suppressed to be low. As in the conventional example of Fig. 3, when the preliminary discharge pulses 5 and 6 are used, in order to set the priming effect for forcibly discharging all pixels so as to be once per several SFs, the preliminary discharge pulses 5 and 6 may be lowered in the SFs other than in Fig. 3 so as to perform only resetting. At this time, in order to make resetting secure, different pulses may be applied several times in place of the preliminary discharge pulses.

Next, the period enters the scanning period 3. In the scanning period 3, scanning pulses 13 are applied to the X1 through Xm of the X electrodes 22 in order. In accordance with the scanning pulses 13, data pulses 9 are applied to D1 through Dn of the data electrodes 29 in accordance with the display patterns. In a pixel to which the data pulse 9 has been applied, a high voltage is applied between the X electrode 22 and data electrode 29, so that writing discharge occurs, a great positive wall charge is formed at the X electrode 22 side, and a negative wall charge is formed at the data electrode 29 side. On the other hand, in a pixel to which the data pulse 9 has not been applied, the applied voltage is low, so that discharge does not occur, and the status of the wall charge does not change. Thus, depending on the existence of the data pulse 9, two statuses of wall charges can be created. The diagonal lines of the data pulses 9 in the Figure indicate that the existence of the data pulse 9 changes in accordance with display data.

When application of the scanning pulses 13 to all lines is finished, the period enters the sustaining period 4. Sustaining pulses 10 are alternately applied to all X electrodes 22 and all Y electrodes 23. The voltage values of the sustaining pulses 10 are set so as not to cause discharge by themselves. Therefore, in a pixel without occurrence of writing discharge, wall charge is little, so that discharge does not occur even when a sustaining pulse is applied. On the other hand, in a pixel in which writing discharge has been occurred, a great positive wall charge exists at the X electrode 22 side, this positive wall charge is superposed on the first positive sustaining pulse (referred to as a first sustaining pulse) applied to the X electrode 22 and, a voltage higher than the discharge starting voltage is applied to the discharge space, whereby sustaining discharge occurs. Due to this discharge, negative wall charges are accumulated at the X electrode 22 side, and positive wall charges are accumulated at the Y electrode 23 side. The next sustaining pulse (referred to as a second sustaining pulse) is applied to the Y electrode 23

side, and in response to superposition of the wall charge, sustaining discharge also occurs herein, and wall charges with a polarity opposite to that of the first sustaining pulse are accumulated at the X electrode 22 side and Y electrode 23 side. Thereafter, discharge still continuously occurs based on the same principle. That is, a potential difference caused by a wall charge generated due to the x-th sustaining discharge is superposed on the x+1-th sustaining pulse and the sustaining discharge is continued. A light emission amount is determined by the number of sustaining discharge continuance.

Please rewrite the paragraphs beginning on page 7, line 14, and ending on page 8, line 27, as follows:

Fig. 5 and Fig. 6 show the drive method. Fig. 5 shows a drive waveform of an odd-numbered field of the conventional example of Fig. 4. Fig. 6 shows a drive waveform of an even-numbered field of the conventional example of Fig. 4. The preliminary discharge period 2 is the same as in the conventional example of Fig. 3. Next, the scanning period 3 is entered. In the scanning period 3, scanning pulses 43 7 are applied to X1 through Xm of X electrodes 22 in order.

Data pulses 9 are applied in response to the scanning pulses 43 7 to D1 through Dn of the data electrodes 29 in accordance with display patterns. The method for applying the data pulses 9 at this time is shown in Fig. 7. In Fig. 7, Y1 to X3 on a certain data electrode of Fig. 4 are arranged horizontally. In the example of Fig. 7, a case of display by turning on and off is shown as in the upper part of the Figure. This drive method is interlace drive, so that the first, third, and fifth pixels in order from the left are caused to display in an odd-numbered field, and the second and fourth pixels are caused to display in an even-numbered field.

First, the case of an odd-numbered field is explained. Among the first, third, and fifth pixels, only the first pixel is a lighting pixel. Therefore, only when a scanning pulse 13 is applied to X1 which is the X electrode 22 of the first pixel, a data pulse 9 is applied. When application of scanning pulses 8 to all lines is finished, the period enters the sustaining period 4. In the odd-numbered field, odd-numbered X electrodes and even-numbered Y electrodes have the same phase, and even-numbered X electrodes and odd-numbered Y electrodes have the same phase. Thereby, in a pixel in which wall charge has been formed in the scanning period, sustaining discharge occurs between the odd-numbered X electrodes and ~~odd-numbered~~ even-numbered Y electrodes and between the even-numbered X electrodes and odd-numbered Y electrodes. In the conventional example of Fig. 7, sustaining discharge does not occur during the first sustaining, however, sustaining discharge occurs from the second sustaining, and thereafter, sustaining discharge is continued. If a wall charge is not formed in the scanning period, sustaining discharge occurs in neither of the odd-numbered fields and even-numbered fields.

Please rewrite the paragraph beginning on page 15, line 13, and ending on page 16, line 22, as follows:

Fig. 8 is a plan view of a 3-electrode AC type plasma display panel of the first embodiment of the invention. The electrode arrangement in the panel is the same as in Fig. 4. m of X electrodes 22 and $m+1$ of Y electrodes 23 are provided and alternately arranged at equal intervals. One cell 31 is at each intersection of the $(2m-1)$ spaces between the X electrodes and Y electrodes and the (n) data electrodes, and a total of $(2m-1) \times n$ of pixels exist. Next, a plan view of one cell is shown in Fig. 9. A sectional view along the A-A' line of Fig. 9 is shown in Fig. 10. As two upper and lower insulating substrates 1 20 and 2, 21, soda-lime glass substrates

with a thickness of 2 through 5mm are used. On the upper insulating substrate 20, transparent electrodes made from tin oxide or indium oxide with a film thickness of 100nm through 500nm are provided so as to be paired as X electrodes 22 and Y electrodes 23. For example, when the cell pitch is set to 0.6mm, the tip widths of the X electrodes 22 and Y electrodes 23 are set to approximately 500 through 550 μm , and the gap between two electrodes is set to approximately 50 through 100 μm . Metal electrodes 32 of Ag or the like with a thickness of approximately 2 through 7 μm are provided on a portion of each transparent electrode to lower wiring resistances. On the metal electrodes, transparent dielectric layers 24 with a thickness of approximately 10 through 50 μm are formed by using PbO-B₂O₃-SiO₂-based low melting point glass paste with a relative dielectric constant of 10 through 25, and baked at 500 through 600°C. Thereon, protective layers 25 for protecting dielectric layers 24 are further formed to be 0.5 through 2 μm in thickness by depositing MgO. Furthermore, along the metal electrodes 32, cell partitions 33 with a width of 50 through 200 μm are provided to be about half (40 through 50 μm) in height of the cell gap (100 through 130 μm). The cell partitions 33 and vertical line partitions 35 which are at the upper insulating substrate 20 side and have the same height as that of the cell partitions 33 (width: approximately 50 through 70 μm) are simultaneously formed by means of sandblasting.

Please rewrite the paragraph beginning on page 21, line 26, and ending on page 23, line 8, as follows:

Then, the period enters the sustaining period 4. In the sustaining period 4, sustaining pulses 10 with negative polarity are alternately applied to the X electrodes 22 and Y electrodes 23. In this embodiment, the sustaining pulses 10 are applied to the Y electrodes 23 first,

however, the sustaining pulses may be applied to whichever first. The voltage of this sustaining pulse 10 is set so as not to cause surface discharge by itself (-160V in this embodiment). At the end of the scanning period 3, the amounts of wall charges formed on the X electrodes and Y electrodes in both lighting and non-lighting cells are the same. Therefore, even if the wall voltage is superposed on the sustaining pulses 10, the potential difference between the surface electrodes is almost 160V, which does not reach a voltage at which discharge is started. However, in a lighting cell, since negative wall charges are formed on the Y electrodes and positive wall charges are formed on the data electrodes, opposed discharge occurs between the Y electrodes and data electrodes. Due to this opposed discharge, as shown in Fig. 22C, great positive wall charges are formed on the Y electrodes. Thereby, if the next sustaining pulses 10 are applied to the X electrodes, the negative wall charges on the X electrodes and positive wall charges on the Y electrodes are superposed on the sustaining pulses 10, surface discharge occurs between the X electrodes and Y electrodes, and as shown in Fig. 22D, the wall charge amounts on the X electrodes and on the Y electrodes become reversed to those in Fig. 22C. After this, as with the drive of the conventional plasma display, sustaining discharge occurs between surface electrodes at every inversion of the sustaining pulses 10 to carry out lighting display. On the other hand, in a case of a non-lighting cell, wall charges are not formed on the X and Y electrodes at the end of the scanning period 3, so that different from the lighting cell, opposed discharge does not occur in response to application of the first sustaining pulse. Even when subsequent sustaining pulses are applied, sustaining discharge does not occur, so that non-lighting display is carried out.

Please rewrite the paragraph on page 35, line 8, and ending on page 36, line 15, as follows:

The seventh embodiment of the invention is explained with reference to both of the drive waveforms of Fig. 8 11 and the panel plan view of Fig. 18. The cell structure is the same as in the conventional example of Fig. 2. The panel electrodes are arranged so that the discharge gaps 37 and non-discharge gaps 38 alternately exist as in the conventional example of Fig. 1. Every two X electrodes are made to share a driver. The drive waveforms are the same as in the first embodiment of the invention. First, in the preliminary discharge period 2, surface discharge occurs between all discharge gaps 37, and negative wall charges and positive wall charges are formed on the X electrodes 22 and Y electrodes 23, respectively. In the case of the present embodiment, no cell partitions 33 or 34 exist on the X electrodes 22 and Y electrodes 23. Therefore, when surface discharge for writing occurs, wall charges are formed on the entire surfaces of the electrodes. The method for writing is the same as in the first embodiment of the invention, surface discharge for writing is caused between the X electrodes 22 and Y electrodes 23, and in exact timing with this, the potentials of the data electrodes 29 are changed to change the wall charge accumulation amounts, whereby writing to lighting and non-lighting cells is changed. The writing order is also the same as in the first embodiment of the invention, that is, writing is carried out for the cell between the X1 and Y1 electrodes at the timing t1, the cell between the X1 and Y2 electrodes at the timing t2, and the cell between the X2 and Y3 electrodes at the timing t3. After writing is successively carried out, the period enters the sustaining period 4. The operation herein is also the same as in the first embodiment of the invention, and in a lighting cell, opposed discharge occurs first, and then surface sustaining discharge is continued. In this embodiment, the drive waveforms of the first embodiment are used, however, the drive waveforms of the second through sixth embodiments may be used.